CHAPTER 1
INTRODUCTION

Emissions from heavy-duty diesel vehicles are major contributors to the total California inventory of particulate and nitrogen oxide (NO_x) emissions. These emissions pose potentially serious environmental and public health impacts. Losses in agricultural productivity from environmental impacts are estimated by the Air Resources Board (ARB) at $300 million to $1 billion per year. Public health impacts include increased rate of respiratory diseases and cancer. Additionally, excessive black smoke from heavy-duty vehicles continue to be the primary target of public complaints regarding air pollution.

In response to the above concerns, Senate Bill 1997 was enacted in 1988, authorizing ARB to design and implement a Heavy-Duty Vehicle Inspection Program (HDVIP). Following a detailed field study of the design of an effective program, the ARB implemented the HDVIP in November, 1991. The study results were presented in a Technical Support Document (TSD) to the Board in 1990 and is referred to in this document as the "1990 TSD", since many of its findings and conclusions are still valid. In addition, a companion Periodic Smoke Inspection (PSI) program requiring periodic self-inspection for California Fleet vehicles was instituted in 1993 in accordance with Senate Bill 2330. The HDVIP and PSI programs were very successful in reducing the number of smoky trucks, but the test procedure used (the "snap acceleration" test) was the focus of much controversy. The California Trucking Association (CTA) has argued that the test incorrectly failed clean trucks, and trucking firms have litigated this issue several times, but the test has been upheld by California courts in all cases.

During the 1993/1994 legislative session, Assembly Bill 584 was enacted by the California Legislature and signed by the Governor. This bill amended the provisions of the California Health and Safety Code governing the HDVIP and specifically required the ARB to adopt the Society of Automotive Engineers (SAE) J1667 procedure. The HDVIP was suspended

in October 1993 at the direction of the Board. SAE finally issued the test procedure, labeled as the SAE J1667 procedure, in February of 1996. This procedure retained the snap acceleration test used by ARB but added new smoke meter specifications and corrections for ambient conditions.

In response to the new SAE J1667 test and new legislation (AB 584) seeking to minimize the possibility of incorrect failures, the ARB sponsored another study to evaluate new pass/fail standards for the HDVIP using the SAE J1667 procedure that will meet the legislative requirements regarding false failures. Under the new legislative guidelines, false failures are defined as "the failure of a vehicle to meet the standards adopted, when the vehicle is in good operating condition and is adjusted to manufacturers specifications." In the ARB Truck Repair Study conducted in the first half of 1997, a wide range of heavy-duty vehicles with different smoke opacities were recruited and repaired by authorized dealerships and repair facilities to manufacturer specifications. The results of this repair study are utilized to develop smoke opacity standards for the redirected HDVIP and PSI program that conform to the legislative requirements. The results of the study are documented in this Technical Support Document, which supports staff's proposal for regulatory amendments to the HDVIP and PSI program.

Chapter 2 of this TSD provides an overview and background on the previous HDVIP and PSI programs, including their legal basis and actual implementation. Chapter 3 discusses the required program redirection as a result of new requirements and the studies conducted by ARB to support the redirection. Chapter 4 details the development of standards for the proposed HDVIP and PSI programs. Chapter 5 addresses truck repairs and repair costs incurred in the truck repair study. Chapter 6 estimates total HDVIP program costs and builds from the original TSD of 1990, since most of the administrative and operational procedures of the HDVIP are proposed to continue unchanged. Chapter 7 estimates program emission benefits and Chapter 8 discusses program cost-effectiveness.